Yacovone, Krista

From: John M. Hoffman <jmhoffman@ashland.com>
Sent: Friday, June 21, 2013 2:58 PM
To: Gorin, Jonathan
Cc: Cardiello, Frank; Robin E Lampkin; Toft, Dennis M.; Buongiorno, Diana; DiPippo, Gary; Carrie McGowan; SMacMillin@Brwncald.com
Subject: Re: Seeking input from stakeholders for the NRRB - LCP Site
Attachments: Ashland ltr.pdf; LCP_NRRB Submission_6-21-2013.pdf

Hi Jonathan,
Attached is ISPES input for the NRRB review on June 26, 2013.
There may be another submission for the review, under separate cover, by the end of the day.
If anyone needs hardcopy of the attached submission, please reply and I will send.

Thanks, and have a great weekend
John

John Hoffman
Project Manager - Remediation
302 995-3233

Ashland Inc.
Environmental Health Safety & Product Regulatory
500 Hercules Road
Wilmington, DE 19808-1599

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From: "Gorin, Jonathan" <Gorin.Jonathan@epa.gov>
To: John M. Hoffman/RCWilm/NA/Herc@Ashland,
Date: 06/07/2013 12:26 PM
Subject: Seeking input from stakeholders for the NRRB - LCP Site

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Hi John, as we discussed, it turns out that I will be going in front of EPA's National Remedy Review Board on June 26 to discuss options for the LCP site. If you wish to provide any input to the board, please follow the directions on the attached letter.

If you have any questions, please let me know.

Jon

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NEW YORK 10007-1866

June 7, 2013

ELECTRONIC DISTRIBUTION & REGULAR MAIL

John Hoffman
Ashland Inc.
Environmental Health Safety & Product Regulatory
Research Center
500 Hercules Rd.
Wilmington, DE 19808

Re: LCP Chemicals, Inc Superfund Site.
Opportunity to Submit Comments to National Remedy Review Board

Dear Mr. Hoffman:

The U.S. Environmental Protection Agency (EPA) Region 2 is schedule to present the LCP Chemicals Superfund Site to the EPA's National Remedy Review Board (NRRB) on June 26, 2013. The NRRB typically review proposed cleanup decisions that could cost more than 25 million dollars. The NRRB's goal is to help evaluate whether potential decisions are consistent with current law, regulations and Agency policy.

By this letter EPA is notifying you that you may submit input (up to 20 pages) on alternatives for the Site's cleanup as part of this early consultation process. You may include discussion of land use preferences, future development considerations and priorities for moving forward with the remedy.

The NRRB meetings are pre-decisional deliberative discussions and are not open to the general public. The intent of the meetings is to offer a critical discussion on remedy selection and cost effectiveness issues before the Agency formalizes its position on the preferred cleanup strategy. It is important to note that the NRRB process does not affect EPA's current procedures for soliciting public comment when the plan for the preferred alternative is released. More information on the NRRB can be found at www.epa.gov/superfund/programs/nrrb/index.htm.

If you wish to submit recommendations or comments for the NRRB's consideration, they should be received by EPA Region 2 on or before June 21, 2013. Please send submittals via e-mail to gorin.jonathan@epa.gov. Hard copies may also be submitted to:

Jon Gorin
New Jersey Remediation Branch
U.S. Environmental Protection Agency, Region 2
290 Broadway 19th Floor
New York, NY 10007-1866

If you have any question, please do not hesitate to call me at (212) 637-4361.

Sincerely yours,

Jon Gorin, Project Manager
Southern New Jersey Remediation Section

ASHLAND.

Ashland Inc.

Research Center
500 Hercules Road
Wilmington, DE 19808-1599
Tel: 302-995-3233, Fax: 302-995-3485

June 21, 2013

Mr. Jonathan Gorin
Remedial Project Manager
United States Environmental Protection Agency, Region II
290 Broadway
19th Floor
New York, New York 10007-1866

Re: LCP Chemicals, Inc Superfund Site (USEPA ID# NJD079303020)
National Remedy Review Board

Dear Mr. Gorin:

Pursuant to the US Environmental Protection Agency's (USEPA) June 7, 2013 e-mail with attached letter, ISP Environmental Services Inc. (ISPES) is providing this letter and accompanying information as input to the National Remedy Review Board's (NRRB) deliberative remedy review process for the LCP Chemicals Inc. Superfund Site, scheduled for June 26, 2013.

The *Draft Feasibility Study* (FS) report that was submitted to the USEPA on December 12, 2011, is based on a comprehensive site characterization, the findings of which are presented in the *Final Human Health Risk Assessment*, the *Baseline Ecological Risk Assessment*, and the *Remedial Investigation*. These documents have been submitted to the USEPA and have been thoroughly vetted through the course of the USEPA review process. The FS has been prepared consistent with USEPA guidance, and follows a logical and sequential approach to alternative development, screening, detailed evaluation, and comparative analysis.

ISPES believes that the Draft FS report leads to the logical and practicable conclusion regarding remedy selection that the containment components of the alternatives (cap, barrier wall, overburden groundwater collection) provide the primary means for protection of human health and the environment based on the following:

- The Site was filled with anthropogenic fill (historic fill as mapped by NJDEP) to permit site development, which contains a variety of contaminants above chemical-specific ARARs, and for which the only practicable remedy is containment (for the LCP site this is a cap and barrier wall). As such, a containment remedy would be implemented at this Site regardless of whether other remedial components are included or not. A containment-based remedy for anthropogenic fill is also consistent with the NJDEP's recently issued presumptive remedy guidance (NJDEP, July 2011) applicable to new residential construction, child care centers, public schools, private schools, and charter schools. In all cases, even for these less restrictive uses, the presumptive remedies are barriers, buffers, demarcation, and institutional controls.

- Mercury contamination at the site is co-located with other contaminants that are related to past site operations, as well as those that are unrelated to past site use and are a consequence of the presence of anthropogenic fill. These various contaminants are present at the site within the fill at levels above acceptable risk thresholds under baseline conditions. Figures 6-47 and 6-48 from the RI illustrate the concept of co-location and general distribution of contaminants at the site and are attached for ease of reference as Attachment A. The chemicals of potential concern (COPCs) identified at the site by comparison to published chemical-specific ARARs (e.g., the NJ Soil Remediation Standards), the human health risk assessment, and the baseline ecological risk assessment are shown in the attached table (Attachment B). As this table illustrates, there are a diverse group of contaminants that contribute to excess site risks. Short of complete removal of the historic, anthropogenic fill (over 300,000 cubic yards of material), which would be contrary to presumptive remedy guidance and typical remedy selection criteria for such fill, the containment components are necessary for protection of human health and the environment.

- The containment components of the various remedial alternatives function equally well for the mercury contamination, including the principal threat waste (defined at this site as soil and building materials containing visible elemental mercury) in protecting human health and the environment. The cap used in the alternatives includes a membrane to control the potential for mercury vapor migration. Further, ISPES has introduced the concept of a treatment cap wherein a layer of sulfur would be placed below the membrane to form a treatment barrier for conversion of elemental mercury vapor to the non-volatile and basically insoluble mercuric sulfide form. The FS has also included a barrier wall for the containment portion of the alternatives as an added measure to secure the site and the potential for lateral movement of contaminants. Of note, once the containment envelope is complete, the overburden groundwater, which is a consequence of infiltration of precipitation, will dewater, and there will no longer be a potential groundwater pathway for contaminant transport.

- As discussed in detail in Section 7.4 of the RI, mercury is present primarily in the insoluble forms of mercuric sulfide and elemental mercury. The sequential extraction testing performed for the RI confirmed that the majority of mercury exists in site soils as these most insoluble species. The general absence of mercury in overburden groundwater, despite the presence of visible mercury in the site soils, further supports this conclusion. A slide used during the joint meeting of the USEPA and the NJDEP on September 11, 2012 is attached for reference (Attachment C) and illustrates the general absence of dissolved mercury. Despite the presence of visible elemental mercury in the area of the former cell buildings, there are only two groundwater monitoring wells with dissolved phase mercury concentrations above the NJ groundwater quality standards. Overall, migration of mercury in the subsurface has been limited and further migration is not anticipated, and even so, the containment components of the remedy are comprehensive to further secure the site and provide protection of human health and the environment.

- The cap and barrier wall remedy components are generally similar to that which was implemented at the adjacent Linden Property Holdings (former GAF) site, and have demonstrated effectiveness for over 10 years with respect to controlling direct contact exposure and groundwater containment. Furthermore, the proposed LCP cap will contain an additional membrane layer, not included in the Linden Property Holdings cap, which will prevent exposure to mercury vapors and infiltration. There is no doubt that these proven components of the remedy will function as intended in protecting human health and the environment.

Although the containment components of the alternative remedies evaluated in the FS are effective and will be protective of human health and environment, ISPES understands the preference under SARA for remedies that include treatment, and in particular the EPA's preference to treat principal threat waste (PTW). Because of this understanding, during the course of the development of the FS, treatment alternatives were thoroughly evaluated. The results of this evaluation may be summarized as follows:

- The USEPA has maintained retorting as the treatment standard under the land disposal restrictions for high level mercury hazardous waste. Retorting was, therefore, one of the first technologies considered for treatment of PTW (although all of the PTW would not necessarily be hazardous by characteristic based on TCLP testing performed during the RI) at the LCP site, and was evaluated throughout the course of the preparation of the FS. Retort capacity is limited at fixed facilities in the US such as the Bethlehem Apparatus Company and Waste Management Union Grove Facility, two of the largest retort facilities in the US. These facilities have the ability to process mercury wastes in drum and small truckload quantities. For instance, the Waste Management Union Grove facility can process up to 1,000 pounds per hour, and assuming eight hours of operation per day, could process 4 tons of material per day. The estimated quantity of PTW soil at the LCP site is a total of 23,600 cubic yards, or conservatively approximately 35,000 tons. At a processing rate of four tons per day, the time required to retort this material would be 8,850 days or 24 years assuming operation 365 days per year. For a more conventional 300 days per year of operation the processing time would be nearly 30 years. This is clearly not a practicable alternative.

- Because of the limited capacity at fixed facilities, the potential for retorting on site was also evaluated. An on-site retort was eliminated early in the technology evaluation process because of the extensive approval process that would be necessary to meet the substantive requirements of a TSD facility under RCRA, in particular the air permit-equivalent requirements necessary for implementation and health and safety considerations. In addition, thermal treatment facilities are the subject of substantial public opposition in the State of New Jersey. Nonetheless, during the course of the FS and even after submittal of the draft FS report to the USEPA, evaluation of this technology was performed on its technical merits. Mercury Recovery Services (MRS) is a vendor of portable retort facilities that can be constructed at a site (i.e., MRS does not have a fixed facility) and has what is considered a high capacity process (i.e., 2 tons per hour). There were a number of issues that made this MRS alternative impracticable as well:

  - MRS has not permitted a facility in the state of New Jersey, and when inquiries were made to assess the likelihood of meeting the NJ permit equivalent requirements for such a facility, particularly for air emissions, MRS was not able to provide a factual basis for confirming that this would be possible.

  - MRS' maximum treatment rate is 2 tons per hour. Again for the 35,000 tons of PTW and using 8 hours of processing per day, this would mean a treatment duration of six years assuming 365 days per year. For a more conventional 300 days per year of operation the processing time would be nearly seven and a half years. Each of these calculations assumes uninterrupted operation without downtime for maintenance or any mechanical difficulties. And, this does not include the building materials (porous masonry) which also contain visible elemental mercury.

  - The PTW includes the fill which can be a variable mix of soil, slag, cinders, bricks, etc., typical of an anthropogenic fill, and as noted above a portion of the building materials. The MRS process includes a screening and crushing operation prior to the thermal treatment for sizing of the waste stream. This sizing operation would include the building material PTW, but may also include portions of the site soils. Experience has shown that disturbance of materials containing elemental mercury greatly increases the mercury vapor emissions. Figure 6-1 from the FS report is attached hereto for ease of reference (Attachment D) and illustrates that the mere handling of material containing elemental mercury can increase emissions rates by orders of magnitude (see stockpiling notation on Figure 6-1).

  - Even if the technology were able to be permitted and operated for the extended period of time necessary to complete the treatment of the PTW, the end result is separated elemental mercury for which there is no market in the US and which cannot be exported from the US (i.e., the Mercury Export Ban Act went into effect in January 2013). Thus, the mercury would have to be held in containment as an end result in any event, albeit in a more concentrated form.

- Research performed for the FS also indicated that mercury contaminated soils similar to that found at the LCP Site have been disposed of at the USEcology/Stablex facility in Canada for other remediation sites (e.g., Ventron-Velsicol). However, based on discussions with USEcology/Stablex, prior disposal operations for soils containing visible elemental mercury have never been performed by USEcology at the scale contemplated for the LCP Site. USEcology/Stablex has, therefore, indicated uncertainty regarding acceptance, production rate, retort requirements, and health and safety issues. To the extent the material is treated by the Stablex process, documentation supporting the applicability of this process to elemental mercury has not been provided by USEcology/Stablex. Residual untreated mercury in the treatment tanks would have to be sent for retort, and under the Mercury Export Ban Act, would have to be returned to the site where it would, again, be contained. In addition, processed material is disposed in the USEcology/Stablex landfill, so again the ultimate disposition is containment.

- Use of the USEcology/Stablex facility also circumvents the intent of the Land Disposal Restrictions for mercury-containing hazardous wastes, and the alternative treatment standards for contaminated soil, by exporting the material outside of the US where regulations are less stringent. This alternative also brings with it uncertainty regarding future liability for disposal outside of the US without any meaningful added protection of human health and the environment, and without diminishing existing liability at the LCP Site.

- In addition, research performed during the FS has also not been able to confirm any disposal facility in the U.S. that could accept mercury-containing soil at the scale contemplated for the LCP Site and treat it in accordance with the Land Disposal Restrictions or confirm the ability to meet the alternative treatment standards for contaminated soil. Transporting mercury containing soil for off-site disposal with potential short-term impacts such as increased mercury vapor emissions, transportation risks (e.g., spills, nearly 1,600 one-way trips for soils), and increased greenhouse gas emissions, is not logical when the material's ultimate disposition is containment in a landfill, similar to what would be the case if the material remains on site within the containment system included with the various alternatives.

- During the course of the FS, solidification/stabilization (S/S) technology was evaluated in detail. Conventional S/S of mercury contaminated soils has shown mixed results relating to solubility of mercury. The solubility of mercury is affected by pH as well as conversion of mercuric sulfide to other more soluble species (e.g., mercuric oxide) during the S/S process. Stabilization technology has been extensively studied at the Brookhaven National Labs (BNL), and BNL has patented a mercury treatment process of S/S with sulfur polymer cement (actually closer to stabilization followed by microencapsulation) which has shown the ability to stabilize elemental mercury, but is not a commercially available technology. Nonetheless, during the course of evaluating this technology, Dr. Paul Kalb who led BNL's work on mercury stabilization was consulted in conjunction with USEPA, and confirmed that elemental mercury can be stabilized to mercuric sulfide. However, treatability testing and potentially pilot testing would be necessary prior to full-scale implementation as this technology can be affected by the characteristics of the medium and the ability to completely expose the elemental mercury to the sulfur. In addition, as noted in the FS, Section 7.2.4, a meaningful treatment efficiency for this technology would have to be achieved to make the technology applicable to the site. A meaningful treatment efficiency can be defined based on relevant regulatory standards as follows:

    - 90% conversion of elemental mercury to mercuric sulfide as an initial target based on both the alternative treatment standards for contaminated soil (40 CFR 268.49) and the CAMU regulations pertaining to treatment requirements (40 CFR 264.552). Lower conversion rates would be evaluated in the context of the adjustment factors provided in 40 CFR 264.522.

- o Achieving the leachability standard of 0.2 mg/L of mercury in TCLP extract. Because mercury leachability is already low, as previously noted, this criterion should also include a statistically meaningful (e.g., 90% confidence level) difference in leachability between pre- and post-treatment testing.
- o Also because mercury leachability is already low, as a consequence of attempting to convert elemental mercury to mercuric sulfide, not increasing the leachability of mercury or other contaminants found on site. For example, creating a reducing environment in support of conversion of elemental mercury to mercuric sulfide could cause release of arsenic because of a reduction of iron from the trivalent to divalent form (i.e., arsenic precipitates with ferric iron).
- o Finally, because each alternative includes containment that would functionally meet the CAMU design requirements, evaluate the treatment efficiency (i.e., conversion of elemental mercury to mercuric sulfide and mercury leachability) in the context of the adjustment factors provided for in 40 CFR 264.552. This evaluation should include the practicability, meaningfulness, and short-term risks of treatment (e.g., mercury vapor emissions), as applicable, by comparison to the containment provided by the other components of the remedy and the risk reduction afforded by the treatment.

- Applying a mercuric sulfide conversion technology alters only the form of mercury, the total mass of mercury remaining is the same. Therefore, without the benefit of the containment components, the site would still exceed the risk benchmarks (for mercury and other contaminants) for protection of human health and the environment. Other technologies, such as on-site retort or off-site disposal would alter the quantity of mercury present at the site and address the PTW, but as previously noted, would not alter the fact that containment would still be necessary to address mercury and other contaminants that would remain on site within the anthropogenic fill at levels above the risk benchmarks.

Overall, ISPES believes that the RI and FS prepared for the LCP site present a reasoned and factual basis for USEPA to select a remedy. ISPES further believes that the information presented above collectively supports selection of the containment remedy (Alternative No. 3). However, to the extent that a treatment component is selected for the PTW, the only potentially practicable alternative applicable to the site-specific conditions is sulfur stabilization (Alternative No. 4), which would have to be subject to pre-design verification.

ISPES hopes that this information is useful to the NRRB's deliberative process and appreciates the opportunity to provide input.

Sincerely,

John Hoffman

John Hoffman

Enclosures

cc: F. Cardiello, Esq., USEPA
G. DiPippo, P.E., Cornerstone Env. Group, LLC
S. MacMillin, Brown & Caldwell
C. McGowan, EHS Support LLC

R. Lampkin, Esq., Ashland Inc.
D. Toft, Esq., Wolff and Samson, PC
D. Buongiorno, Esq., Wolff and Samson PC

ATTACHMENT A
RI FIGURES 6-47 AND 6-48

FIGURE 6-47

CONTAMINANT CO-LOCATION
UPPER 20 % CONCENTRATIONS
SURFICIAL AND DEEP FILL

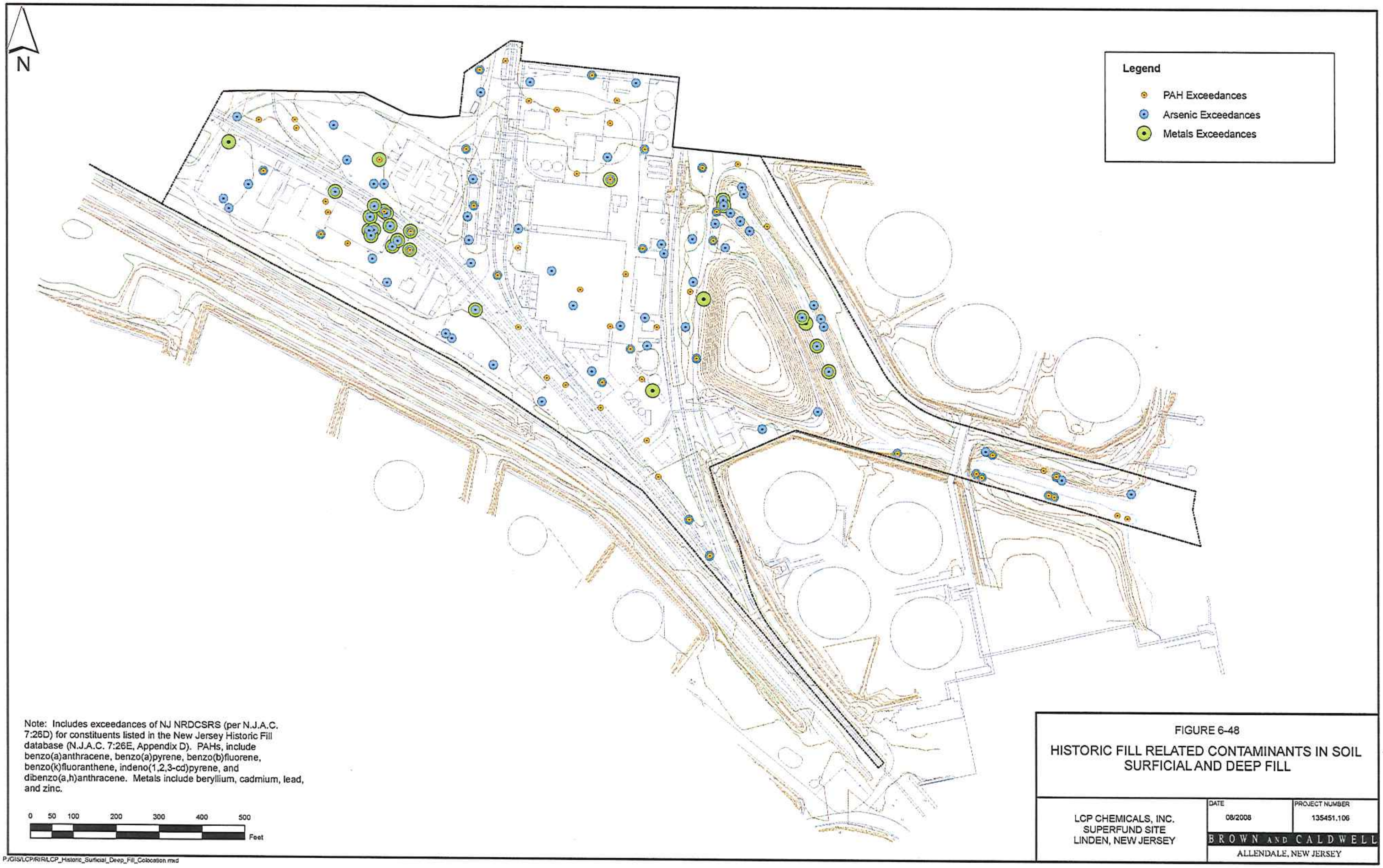
LCP CHEMICALS, INC.
SUPERFUND SITE
LINDEN, NEW JERSEY

DATE 06/17/08

PROJECT NUMBER 135451.106

BROWN AND CALDWELL
ALLENDALE, NEW JERSEY

P:/GIS/LCP/RIR/LCP_Contaminant_Colocation_20pct.mxd



Note: Includes exceedances of NJ NRDCSRS (per N.J.A.C. 7:26D) for constituents listed in the New Jersey Historic Fill database (N.J.A.C. 7:26E, Appendix D). PAHs, include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluorene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, and dibenzo(a,h)anthracene. Metals include beryllium, cadmium, lead, and zinc.

FIGURE 6-48

HISTORIC FILL RELATED CONTAMINANTS IN SOIL SURFICIAL AND DEEP FILL

LCP CHEMICALS, INC. SUPERFUND SITE LINDEN, NEW JERSEY	DATE 08/2008	PROJECT NUMBER 135451.106
	BROWN AND CALDWELL ALLENDALE, NEW JERSEY	

P:/GIS/LCP/RIR/LCP_Historic_Surficial_Deep_Fill_Collocation.mxd

ATTACHMENT B
TABLE OF COPCs

LCP Chemicals Inc. Superfund Site
Chemicals of Potential Concern (COPCs)

COPC	Soil	Groundwater	Sediment	SITE OPERATIONS RELATED		Basis
				YES	NO	
Aluminum		x			x	E
Antimony	x	x			x	A,B,E
Arsenic	x	x	x		x	A,B,D,E,F
Barium	x	x	x		x	A,B,E
Beryllium	x				x	B
Cadmium	x	x	x		x	A,B,D,E,F
Chromium	x	x	x		x	B,E,F
Cobalt	x	x			x	A,B,D,E
Copper			x		x	B,F
Iron	x	x	x		x	A,C,E
Lead	x	x	x		x	B,D,E,F
Manganese		x	x		x	A,B,E
Mercury	x	x	x	x		A,B,D,E,F
Nickel		x	x		x	E,F
Selenium	x				x	B
Silver			x		x	F
Vanadium	x	x	x		x	A,B
Zinc	x		x		x	B,D,F
Acenaphthene			x		x	F
Acenaphthylene			x		x	F
alpha-chlordane	x				x	B
Aniline		x			x	E
Anthracene			x		x	F
Benz(a)anthracene	x	x	x		x	A,D,E,F
Benzo(a)pyrene TEQ	x		x		x	A,D,F
Benzo(b)fluoranthene	x				x	D
Benzo(k)fluoranthene	x				x	D
Carbazole		x			x	A
Chloroaniline, p-		x			x	A,E
Chrysene			x		x	F
Dibenz(a,h)Anthracene	x		x		x	D,F
Fluoranthene			x		x	F
Fluorene			x		x	F
Dichlorobenzene, 1,2-		x			x	A,E
Dichlorobenzene, 1,4-	x	x			x	A,D,E
Dichlorophenol, 2,4-		x			x	E
Dinitrotoluene, 2,4-	x				x	D
Dinitrotoluene, 2,6-	x				x	D
Hexachlorobenzene	x	x		x		A,B,D,E
Hexachlorobutadiene	x	x			x	D,E
Indeno(1,2,3-c,d) Pyrene	x				x	D
Naphthalene	x	x	x		x	A,D,E,F
Nitrobenzene		x			x	A,E
Methylnaphthalene, 2-		x	x		x	E,F
PCBs	x		x	x		A,B,D,F
PCDDs		x	x		x	A,B
PCDFs	x	x	x	x		A,B
Pentachlorophenol		x			x	A,E
Phenanthrene			x		x	F
Pyrene			x		x	F
Trichlorobenzene, 1,2,4-	x	x			x	A,D,E
Toulene		x			x	E
Benzene		x			x	A,D,E
Chloride		x			x	E
Chlorobenzene		x			x	A,E
Chloroform	x				x	D
Dibromoethane, 1,2-	x				x	D
DBCP	x				x	D
Ethylbenzene		x			x	A
Methylene Chloride	x	x			x	A,D,E
Tetrachloroethylene (PCE)	x	x			x	A,D,E
Trichloroethylene (TCE)	x	x			x	A,B,D,E
Vinyl Chloride		x			x	A

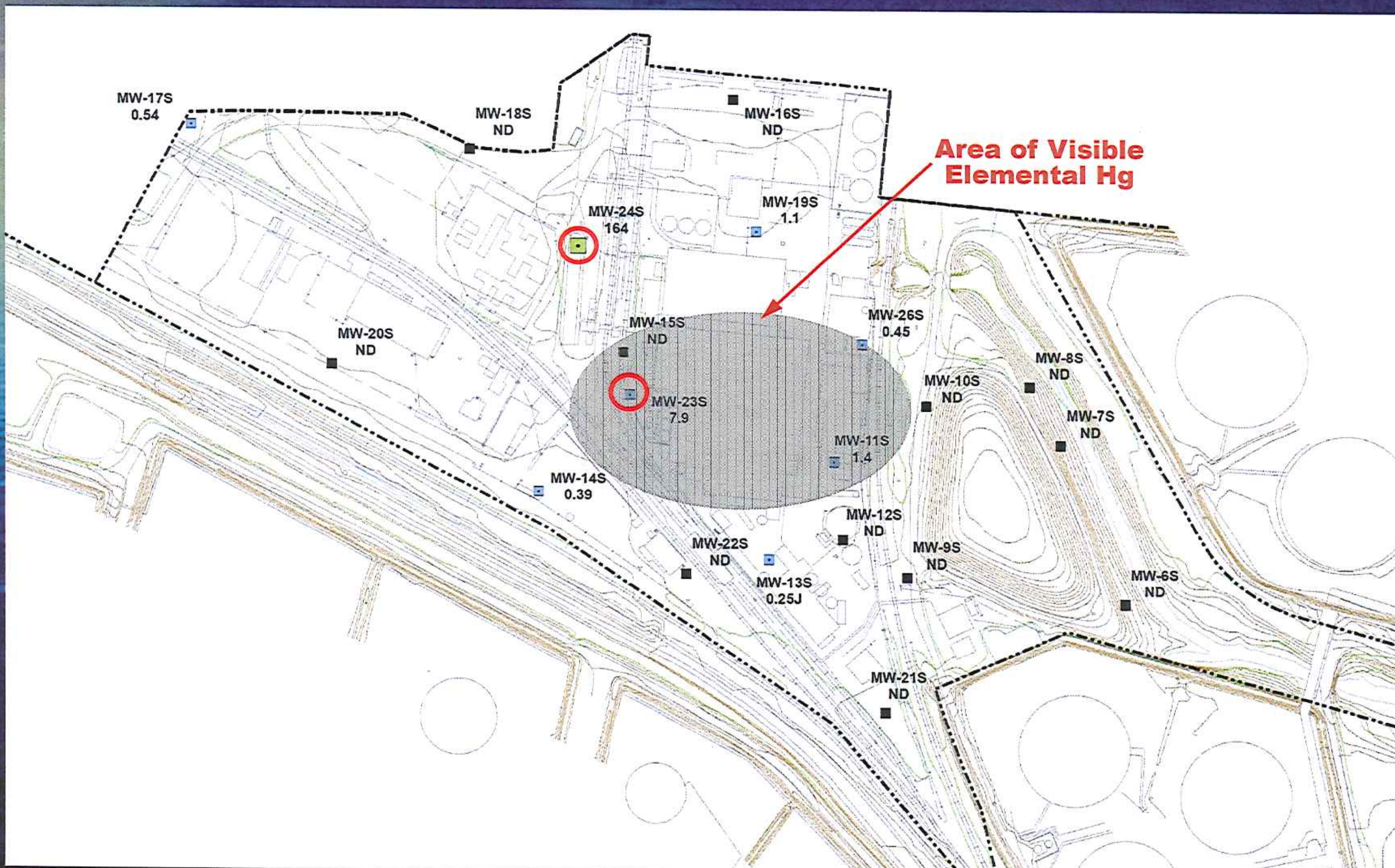
Note:
Sodium found in overburden groundwater above NJDEP Class IIA Standards. However, due to brackish nature of the groundwater, it is not included as a COPC.

Basis Key:
A - Human Health Risk
B - Ecological Risk (BERA COPC Table)
C - Also included from BERA Problem Formulation with USEPA
D - Greater than NJDEP Non-Residential Direct Contact Soil Remediation Standard
E - Greater than NJDEP Class IIA Ground Water Quality Criterion
F - Greater than NJDEP Sediment Screening Level

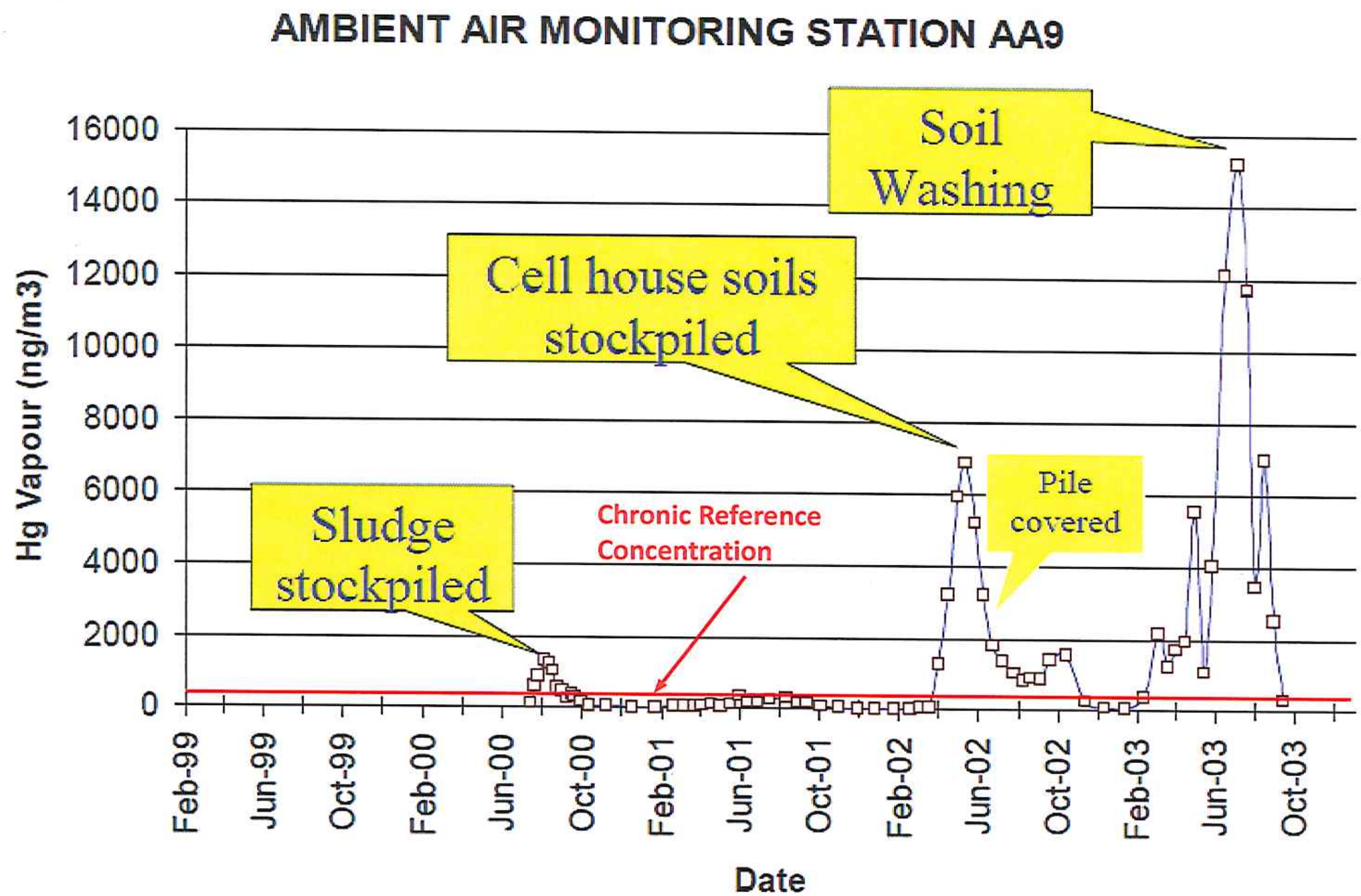
ATTACHMENT C
OVERBURDEN GROUNDWATER MERCURY CONCENTRATIONS
SEPTEMBER 11, 2012 MEETING PRESENTATION SLIDE

FOR DISCUSSION PURPOSES

Dissolved Hg
Overburden Groundwater



ATTACHMENT D
FEASIBILITY STUDY REPORT FIGURE 6-1



Source: Highlands Remediation Squamish, Soil Washing Project

CORNERSTONE Engineering Group, LLC

FEASIBILITY STUDY – LCP CHEMICALS, INC. SUPERFUND SITE, LINDEN, NEW JERSEY

EXAMPLE SOIL WASHING MERCURY VAPOR EMISSIONS

FIGURE NO. 6-1

PROJECT NO. 090432